THE ASTROPHYSICAL JOURNAL CONTENTS OF VOLUME 351, PART 1

1990 MARCH 1, Number 1

	Page	Fiche
EVOLUTION OF CLUSTERS IN A HYBRID HOT DARK MATTER UNIVERSE	1	38-B1
GALAXY CLUSTERS AND THE AMPLITUDE OF PRIMORDIAL FLUCTUATIONS Carlos S. Frenk, Simon D. M. White, George Efstathiou, and Marc Davis	10	- 38-B11
CONSTRAINTS ON LARGE-SCALE CLUSTERING FROM THE AUTOCORRELATION PROPERTIES OF THE X-RAY BACKGROUND	22	38-C10
ON INTERSTELLAR LITHIUM TOWARD SN 1987A AS AN INDICATOR OF PRIMORDIAL LITHIUM Robert A. Malaney and Charles R. Alcock	31	38-D6
THE DISK ACCRETION OF A TIDALLY DISRUPTED STAR ONTO A MASSIVE BLACK HOLE John K. Cannizzo, Hyung Mok Lee, and Jeremy Goodman	38	38-E1
ACCRETION DISK THERMAL INSTABILITY IN GALACTIC NUCLEI	47	38-E11
WEAKLY BARRED, EARLY-TYPE RINGED GALAXIES. I. THE SEYFERT GALAXY NGC 3081	62	38-G2
HIGH-RATE SPECTROSCOPIC ACTIVE GALACTIC NUCLEUS MONITORING AT THE WISE OBSERVATORY. I. MARKARIAN 279 D. Maoz, H. Netzer, E. Leibowitz, N. Brosch, A. Laor, H. Mendelson, S. Beck, E. Almoznino, and T. Mazeh	75	39-A5
AFGL 2004: AN INFRARED QUINTUPLET NEAR THE GALACTIC CENTER Tetsuya Nagata, Charles E. Woodward, Mark Shure, Judith L. Pipher, and Haruyuki Okuda	83	39-B1
AN INFRARED QUINTUPLET NEAR THE GALACTIC CENTER Haruyuki Okuda, Hiroshi Shibai, Takao Nakagawa, Hideo Matsuhara, Yukiyasu Kobayashi, Norio Kaifu, Tetsuya Nagata, I. Gatley, and T. R. Geballe	89	39-B11
THE AGE CALIBRATION OF INTEGRATED ULTRAVIOLET COLORS AND YOUNG STELLAR CLUSTERS IN THE LARGE MAGELLANIC CLOUD	98	39-C8
GEOMETRIC APPROACH TO SECULAR AND NONLINEAR STABILITY FOR SPHERICAL STAR CLUSTERS Henry E. Kandrup	104	39-DI
FERMAT PRINCIPLE IN ARBITRARY GRAVITATIONAL FIELDS	114	39-E1
EVOLUTION OF GLOBULAR CLUSTERS IN THE GALAXY	121	39-E9
A FURTHER STUDY OF THE MOLECULAR CLOUD ASSOCIATED WITH THE SUPERNOVA REMNANT G109.1-1.0 Ken'ichi Talematsu, Yasuo Fukui, Takahiro Iwata, Frederick D. Seward, and Makoto Nakano	157	40-A4
SUBPARSEC CLUMPING IN THE NEARBY MOLECULAR CLOUD MBM 12 Marc W. Pound, T. M. Bania, and R. W. Wilson	165	40-B1
ORION B (NGC 2024). II. HAT CREEK SYNTHESIS OBSERVATIONS OF THE MOLECULAR CORE IN THE J=1→0 LINE OF HCO ⁺	176	40-C2
VLA OBSERVATIONS OF THE 6 CENTIMETER AND 2 CENTIMETER LINES OF H ₂ CO IN THE DIRECTION OF W49 Hélène R. Dickel and W. Miller Goss	189	40-D2
EQUILIBRIUM MODELS FOR SELF-GRAVITATING INVISCID DISKS RESULTING FROM THE COLLAPSE OF ROTATING CLOUDS	206	40-E7
DUST AROUND AFGL 2688, MOLECULAR SHIELDING, AND THE PRODUCTION OF CARBON CHAIN MOLECULES M. Jura and H. Kroto	222	40-G1
EVOLUTIONARY VERSUS DYNAMICAL TIME SCALES FOR THE EVOLUTION OF THE CENTRAL STARS OF PLANETARY NEBULAE J. K. McCarihy, J. R. Mould, R. H. Mendez, R. P. Kudritzki, D. Husfeld, A. Herrero, and H. G. Groth	230	40-G1

	Page	Fiche
HYDROGEN BURNING AND DREDGE-UP DURING THE MAJOR CORE HELIUM FLASH IN A Z = 0 MODEL STAR David Hollowell, Icko Iben, Jr., and Masayuki Y. Fujimoto	245	41-B1
EVOLUTION OF CEPHEIDS. I. THE EFFECTS OF AN ENHANCED 12C(α,γ)16O RATE W. M. Brunish and S. A. Becker	258	41-C1
THE MOLECULAR ENVELOPE OF MIRA	263	41-C7
HOT DEGENERATES IN THE MCT SURVEY. I. MCT 0130-1937, A NEW, COLOR-SELECTED PG 1159 OBJECT S. Demers, F. Wesemael, M. J. Irwin, G. Fontaine, R. Lamontagne, S. O. Kepler, and J. B. Holberg	271	41-D2
THE PERSISTENT COMA OF COMET P/SCHWASSMANN-WACHMANN 1	277	41-D10
CONDITIONS FOR VERTICAL PROPAGATION OF MAGNETOACOUSTIC WAVES IN AN ISOTHERMAL ATMOSPHERE Z. E. Musielak	287	41-F1
COMMENTS ON COMPRESSIBLE EFFECTS ON ALFVÉN NORMAL MODES IN NONUNIFORM PLASMAS Y. Mok and G. Einaudi	296	41-F11
⁷ Li AND ⁷ Be DE-EXCITATION LINES: PROBES FOR ACCELERATED PARTICLE TRANSPORT MODELS IN SOLAR FLARES	299	41-G1
ROTATION OF DOPPLER FEATURES IN THE SOLAR PHOTOSPHERE Herschel & Snodgrass and Roger K. Ulrich	309	42-A1
DOPPLER-SHIFTED EMISSION FROM HELIUM IONS ACCELERATED IN SOLAR FLARES Th. Peter, E. N. Ragozin, A. M. Urnov, D. B. Uskov, and D. M. Rust	317	42-A10
DETECTION OF PARITY OF A BINARY STAR IN TRIPLE CORRELATION SPECKLE INTERFEROMETRY. I. SIGNAL-TO-NOISE RATIO	334	42-C1
INSTRUCTIONS TO AUTHORS	i	42-D1
1990 MARCH 10, Number 2		
THE COSMIC SUBMILLIMETER BACKGROUND AS A POSSIBLE SIGNATURE OF THE INITIAL BURST OF GALAXY FORMATION	343	44-C1
COSMIC-STRING-INDUCED HOT DARK MATTER PERTURBATIONS	356	44-D1
THE LYMAN LIMIT ABSORPTION SYSTEM IN THE SPECTRUM OF PKS 2126—158: HEAVY-ELEMENT ABUNDANCE AT HIGH REDSHIFT	364	44-D11
EMISSION-LINE OBJECTS NEAR QSO ABSORBERS. I. NARROW-BAND IMAGING AND CANDIDATE LIST Brian Yanny, D. G. York, and T. B. Williams	377	44-F1
EMISSION-LINE OBJECTS NEAR QSO ABSORBERS. II. ANALYSIS AND IMPLICATIONS OF STAR-FORMING OBJECTS AT MODERATE REDSHIFT	396	45-A1
INFRARED EMISSION FROM CENTRAL DOMINANT GALAXIES IN X-RAY LUMINOUS CLUSTERS Joel N. Bregman, Brian R. McNamara, and Robert W. O'Connell	406	45-B1
INTERSTELLAR ABSORPTION LINES IN THE GALAXY NGC 1705 D. G. York, A. Caulet, P. Rybski, J. Gallagher, J. C. Blades, D. C. Morton, and W. Wamsteker	412	45-B9
HOT GAS IN THE NUCLEUS OF M82: 12 CO AND 12 CO $J=3-2$ OBSERVATIONS Jean L. Turner, Robert N. Martin, and Paul T. P. Ho	418	45-C5
DENSE MOLECULAR GAS, STAR FORMATION, AND THE CO TO H2 CONVERSION FACTOR IN NEARBY GALAXIES Leslie J. Sage, Steven N. Shore, and P. M. Solomon	422	45-C10
TWO MICRON SPECTROSCOPY OF THE BLUE COMPACT DWARF GALAXY HARO 2 T. J. Davidge and JP. Maillard	432	45-D8
OPTICAL DETECTION OF THE REMNANT OF SN 1980K IN NGC 6946 Robert A. Fesen and Robert H. Becker	437	45-E1
A STUDY OF AFGL 5376: AN UNUSUAL EXTENDED INFRARED SOURCE NEAR THE GALACTIC CENTER Keven Uchida, Mark Morris, and E. Serabyn	443	45-E9
A COARSE-GRAIN SEARCH FOR ANISOTROPY IN THE ARRIVAL DIRECTIONS OF COSMIC RAYS ABOVE 10 ¹⁷ eV G. L. Cassiday, R. Cooper, S. C. Corbatá, B. R. Dawson, J. W. Elbert, B. E. Fick, K. D. Green, D. B. Kieda, S. Ka, E. C. Loh, M. H. Salamon, J. D. Smith, P. Sokolsky, P. Sommers, S. B. Thomas, and B. Wheeler	454	45-F7

CONTENTS

	Page	Fiche
MEASUREMENT OF THE COSMIC-RAY IRON SPECTRUM BETWEEN 60 AND 200 GeV PER NUCLEON Joseph A. Esposito, Robert E. Streitmatter, V. K. Balasubrahmanyan, and Jonathan F. Ormes	459	45-G1
CHEMICAL COMPOSITION OF OPEN CLUSTERS. I. Fe/H FROM HIGH-RESOLUTION SPECTROSCOPY		
Ann Merchant Boesgaard and Eileen D. Friel	467	45-G10
CHEMICAL COMPOSITION OF OPEN CLUSTERS. II. C/H AND C/Fe IN F DWARFS FROM HIGH-RESOLUTION SPECTROSCOPY	480	46-A11
X-RAY STUDIES OF COEVAL STAR SAMPLES. III. X-RAY EMISSION IN THE URSA MAJOR STREAM J. H. M. M. Schmitt, G. Micela, S. Sciortino, G. S. Vaiana, F. R. Harnden, Jr., and R. Rosner	492	46-B11
SEARCH FOR HC ₃ NH ⁺ : THE UPPER LIMIT OF THE COLUMN DENSITY IN TMC-1 T. Amano, S. Saito, S. Yamamoto, K. Kawaguchi, H. Suzuki, M. Ohishi, and N. Kaifu	500	46-C6
H 1 ABSORPTION LIMITS AND EMISSION MAPPING FOR HIGH-VELOCITY CLOUDS Sean W. J. Colgan, Edwin E. Salpeter, and Yervant Terzian	503	46-C10
CIRCUMNEBULAR NEUTRAL HYDROGEN IN PLANETARY NEBULAE A. R. Taylor, G. T. Gussie, and S. R. Pottasch	515	46-E1
MOLECULAR ENVELOPE OF THE PLANETARY NEBULA NGC 7027 S. Deguchi, H. Izumiura, N. Kaifu, X. Mao, Nguyen-Q-Rieu, and N. Ukita	522	46-E9
HIGH-RESOLUTION MOLECULAR OBSERVATIONS OF NGC 7538 IRS 1	530	46-F5
THE SAGITTARIUS B2 STAR-FORMING REGION: SUBARCSECOND RADIO SPECTRAL LINE AND CONTINUUM OBSERVATIONS	538	46-G1
THE EXTRAORDINARY MASS-LOSS BUBBLE G2.4+1.4 AND ITS CENTRAL STAR M. A. Dopita, T. A. Lozinskaya, P. J. McGregor, and S. J. Rawlings	563	47-B1
INFRARED POLARIMETRY OF THE NGC 6334 V BIPOLAR NEBULA Takao Nakagawa, Tetsuya Nagata, Hideo Matsuhara, Haruyuki Okuda, Hiroshi Shibai, and Saeko S. Hayashi	573	47-C1
FORMALDEHYDE MAPPING OF p OPHIUCHI B1: THE DENSEST COLD PRESTELLAR CORE Dimitar D. Sasselov and Slavek M. Rucinski	578	47-C7
THE PROBABLE DUST FORMATION EPISODE AROUND p CASSIOPEIAE	583	47-D1
DETERMINING GRAVITATIONAL RADIATION FROM NEWTONIAN SELF-GRAVITATING SYSTEMS L. S. Finn and C. R. Evans	588	47-D7
GAMMA-RAY BURSTS FROM MAGNETOSPHERIC PLASMA OSCILLATIONS	601	47-E7
CEPHEID RADIAL VELOCITY CURVES REVISITED	606	47-F1
A SURVEY OF BUMP CEPHEID MODEL PULSATIONS J. Robert Buchler, Pawel Moskalik, and Géza Kovács	617	47-G1
VERTICAL STRUCTURE OF ACCRETION DISKS: A SIMPLIFIED ANALYTICAL MODEL	632	48-A5
THE ECLIPSING MILLISECOND PULSAR PSR 1957 + 20 A. S. Fruchter, G. Berman, G. Bower, M. Convery, W. M. Goss, T. H. Hankins, J. R. Klein, D. J. Nice, M. F. Ryba, D. R. Stinebring, J. H. Taylor, S. E. Thorsett, and J. M. Weisberg	642	48-B3
ABOUT THE ECLIPSING WOLF-RAYET BINARY HD 214419, CQ CEPHEI A. B. Underhill, K. K. Gilroy, and G. M. Hill	651	48-C1
A POSSIBLE MEANING OF THE SPECTRUM OF HD 191765, WN6 A. B. Underhill, K. K. Gilroy, G. M. Hill, and N. Dinshaw	666	48-D3
OBSERVATIONS OF A0535 + 26 WITH THE SMM SATELLITE S. Sembay, R. A. Schwartz, S. R. Davies, L. E. Orwig, and B. R. Dennis	675	48-E1
ON THE NUMERICAL CALCULATION OF THE SOLAR ROTATIONAL SPLITTING COEFFICIENTS Bernard R. Durney	682	48-E9
DEPTH AND LATITUDE DEPENDENCE OF THE SOLAR INTERNAL ANGULAR VELOCITY Edward J. Rhodes, Jr., Alessandro Cacciani, Sylvain Korzennik, Steven Tomczyk, Roger K. Ulrich, and Martin F. Woodard	687	48-F1
COLLISION STRENGTHS FOR DIPOLE-ALLOWED TRANSITIONS IN S II	701	48-G3
ERRATA		
RAPIDLY ROTATING NEUTRON STAR MODELS	705	48-G9
THE BEHAVIOR OF THE C IV EMISSION LINE IN ACTIVE GALACTIC NUCLEI	705	48-G9
INDEX TO VOLUME 351 PARTS I AND 2	See Pa	ert 2